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Account of additional Buildings and of Proceedings at the Oxford University Observatory. By Prof. C. Pritchard.

In the *Monthly Notices* for December 1873 and December 1875 I have described the buildings and Astronomical Instruments which the University of Oxford has provided for the use of the Professor of Astronomy. The results that have so far been derived therefrom may be understood from an inspection of the first issue of the *Astronomical Observations* and other astronomical work completed in the new Observatory during the first two years of its existence. Copies of this publication have been presented to the Society and to similar institutions.

At present we are earnestly engaged in measuring and reducing the measures of the Lunar Photographs which have been taken with all possible regularity for now nearly three years, with the De la Rue mirror of 13 inches aperture. The measures are made with a large but very delicate measuring engine, devised by Mr. De la Rue and executed with great precision by Mr. Simms. With care it is capable of measuring angular distances on the lunar photographs equivalent to one-tenth of a second of arc. Certain elaborate measures, and their subsequent numerical reductions, from their remarkable consistency of result, inspire me with the hope that we may in due time succeed in ascertaining the existence and approximate amount of the lunar physical libration. I propose, at the next meeting of the Society, to lay before them a short account of these preliminary measures and reductions; and I think they will be sufficient to show that careful photography is very effectively applicable to certain classes of astronomical investigations.

We have also made one complete set of measures of 40 stars in the *Pleiades* with my new duplex micrometer: this work is now in process of repetition, partly with the view of practically testing how far this instrument is capable of doing such work as is usually assigned to the heliometer; and partly with the view of ascertaining if any relative displacements in this group of stars have occurred since Bessel's celebrated measures of the *Pleiades* with the Königsberg heliometer in 1841. A general description of the principles and construction of this instrument will accompany the communication to the Society referred to in the last paragraph.

This evening I have contributed to the Society a few measures of the coordinates of Tempel's periodical comet at its apparition in July last: they were taken with the Grubb refractor of $12\frac{1}{4}$ inches aperture.

Such, then, is a general and rapid account of the researches completed and undertaken at the University Observatory since its erection three years ago.

My present object, however, is to acquaint the Society with another act of thoughtful liberality on the part of the University

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towards the prosecution of the study of astronomy in Oxford. The buildings containing the large Grubb refractor and the De la Rue reflector, and comprising also two computing rooms, partly occupied by the huge piers supporting the instruments, contained no provision for the Professor's lectures to the University students. This want has now been very effectively supplied by the building, under the auspices of Mr. Charles Barry, of a convenient library and a well contrived lecture room, sufficient to satisfy all reasonable requirements. The dimensions of the lecture room are 40 feet by 27 feet, with a height of 18 feet. It is most amply lighted by five large windows having a northern aspect. The rooms and the entire Observatory are now warmed with hot water pipes; and the large instruments are effectually protected from the deposition of dew by the admission of warm air, at will, through large trapdoors in the ceilings of the rooms below; the trapdoors being provided with strong combings of latticework. With this exception, there is little or no novelty in the arrangements thus described.

But it occurred to me, while designing the large lecture room, that its roof might possibly be utilised for the formation of an out-of-doors or open-air Observatory, provided with suitable instruments for the instruction of the students, and for other purposes of original work. This design has been successfully carried out. The roof of the lecture room is flat and is covered with lead. Over this lead is placed a strong floor of battens with interstices between them for the passage of rain water. A somewhat high parapet extends on all sides above the roof, for the protection of persons upon the latter. Into the walls of the room have been inserted the ends of two very strong flitched beams with iron plates between them, and not touching the roof of the building. These two flitched beams are bolted together, and on them are placed massive stone slabs affording platforms for the telescopes to be placed upon them. These telescopes at present are two; viz. a refractor by Cooke of 4¼ inches aperture, and an exquisite reflector by With of 10¼ inches aperture. Both these instruments are practically free from tremor, even when many persons are assembled on the battened floor, and one or two standing on the beams. This is a degree of success in the mounting of instruments which I hardly ventured to anticipate: but so it is.

A third telescope of 3½ inches aperture is placed on the leaded roof, but not in contact with the battened floor; this also admits of use without any tremor sufficient to annoy. A transparent drum of 2 feet diameter, revolving on an axis pointing to the pole, and containing the allineations of the principal stars, and lighted by a lamp within, completes the astronomical equipment of this somewhat novel out-of-doors Observatory. I ought, however, to remark that all these instruments are provided with light and easily removable housings to protect them from the weather. The roof also is well provided with gaslights for any temporary purpose.

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Besides these astronomical instruments, there is placed on the parapet an efficient form of Campbell's globular lens for measuring and recording the duration, and to a considerable extent the comparative intensity, of sunshine during each day. This (to me, at least) interesting instrument I have covered with a thin cylindrical glass shade; and close to it is a radiation thermometer with a blackened bulb in vacuo. The instrument, *in this protected form of it*, is, I believe, a novelty not without its value; and hitherto its action has been admirable, inasmuch as it is very easy to read at a glance the duration of even any fitful sunshine during a succession of showers, within intervals of three or four minutes of time. By the side of it I have placed a Sun Spectroscope, for the observing of the "*Rain Bands*," together with a new and effective form of Daniells's hygrometer, designed by Mr. Bouillard, for comparison with the spectroscope in the forecasting of rain. Up to the present time the indications have been much to the advantage of the spectroscope. I can hardly doubt that these details of attempts to excite at least the curiosity of a large and important class of University students in subjects more or less astronomical, together with the account of the proceedings of our new Astronomical Institution at Oxford, will not be without their interest to many members of the Society.

I will only add that the Board of Visitors, at the head of which is the Vice-Chancellor, have sent in a recommendation to the University Commission for the furnishing of such funds and instruments as are necessary for the efficient maintenance of the Observatory. They also recommend the founding of a few astronomical studentships for the encouragement of the study of our science.

Oxford University Observatory,
Nov. 1878.

On the Spectrum of the New Star in Cygnus.
By T. W. Backhouse, Esq.

Soon after the appearance of the new star in *Cygnus*, and at various times since, I made observations on its spectrum with one of Browning's miniature spectroscopes on a Cooke's refractor of 4¼ inches aperture. With such small instruments accurate measurements have not been possible; and those I made must be taken for what they are worth.

I compared the spectrum of the star with those of vacuum tubes, of sparks in air, and of a Bunsen's burner; and from these observations I have calculated the positions of the bright lines on Huggins' scale. These are shown in Table I.; and the weight I attach to each observation is also given.

In Table II., Column A, these positions are reduced to wavelengths. My drawings of the spectrum show that these results cannot be all correct, and in Column B are given what I judge therefrom to be more accurate positions, and also those of two